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Published in:
Journal of Psychosomatic Research

Publication date:
2002

Document Version
Publisher's PDF, also known as Version of record

[Link to publication in Tilburg University Research Portal](#)

Citation for published version (APA):
Pedersen, S. S., Middel, B., & Larsen, M. L. (2002). The role of personality variables and social support in distress and perceived health in patients following myocardial infarction. *Journal of Psychosomatic Research*, 53, 1171-1175.

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The role of personality variables and social support in distress and perceived health in patients following myocardial infarction

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Received 29 May 2001; accepted 29 November 2001

Abstract

Objectives: (1) To investigate whether patients with low versus high social support and satisfaction with support report less distress and health complaints following a first myocardial infarction (MI). (2) To examine whether personality traits mediate social support and its effect on distress and health complaints. **Methods:** A questionnaire was distributed to 112 consecutive patients with a first MI 4–6 weeks postinfarction. Objective clinical measures were obtained from the patients' medical records. **Results:** Patients with low social support were at increased risk of depression and posttraumatic stress disorder (PTSD). Patients less satisfied with support were at increased risk of anxiety, depression, PTSD, and reported more health complaints. Generally, larger effect sizes were found for satisfaction with support compared with social support

per se in relation to distress and health complaints. Neuroticism was identified as an independent predictor of all types of distress and health complaints when including both traits and social support variables in multivariable analyses, adjusted for demographic and clinical variables. Satisfaction with support only remained an independent predictor of depression. **Conclusion:** These results suggest that personality traits may mediate social support and its effect on distress and health complaints. Hence, it may be important to include personality variables when investigating social support in relation to distress and health. In clinical practice, screening for particular personality traits could identify patients at risk of distress and recurrent cardiac events. © 2002 Elsevier Science Inc. All rights reserved.

Keywords: Coronary artery disease; Distress; Myocardial infarction; Personality factors; Personality Type D; Social support

Introduction

Social support and personality variables have independently been related to outcome in cardiac patients. Lack of social support has been related to health-related behaviours [1], psychological distress [2–4], cardiac symptoms [2,5], and increased risk of recurrent cardiac events including mortality [6–9]. Social support has also been shown to buffer the impact of depression on mortality [10]. Neuroticism has been identified as an independent predictor of mortality in patients with heart failure [11], and has distinguished between subjects with and without coronary artery disease (CAD) [12]. Neuroticism may also interact with other personality traits adversely affecting prognosis. Stud-

ies on Type D personality indicate that the combination of negative affectivity, which is closely related to neuroticism, with social inhibition is associated with increased risk of depression, vital exhaustion, social alienation, reinfarctions, and mortality independent of established biomedical risk factors [13–15]. Type D also seems to moderate the effects of medical treatment [15,16].

Researchers have emphasised the importance of including personality factors when studying social support in relation to health, since traits may impede the development of social contacts [17,18]. However, no studies have specifically looked at whether social support and its influence on distress and health complaints are mediated by personality traits in cardiac patients.

The objectives were: (1) to investigate whether patients with low versus high social support and satisfaction with support report more distress and health complaints following a first myocardial infarction (MI). Patients with low

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support and satisfaction with support were expected to score higher on distress and health complaints; and (2) to examine whether personality traits mediate social support and its effect on distress and health complaints. Personality traits rather than social support variables were hypothesised to be independent predictors of distress and health complaints when including both in multivariable analyses.

Method

Participants

Consecutive patients with a first MI were recruited from August 1999 to January 2001 from Aarhus University Hospital and Horsens Hospital, Denmark. A diagnosis of MI was based on increased levels of troponin T ($>0.10 \mu\text{g/l}$) and ECG changes [19]. Exclusion criteria were: other life-threatening diseases, cognitive impairments, psychiatric history, and inability to understand and read Danish. Patients were assessed 4–6 weeks post-MI. Of 164 patients screened for inclusion, three were excluded and 12 were not approached due to personnel error. Of the remaining 149 patients, 37 (25%) refused to participate. Thus, analyses are based on 112 (75%) patients. Nonresponders did not deviate systematically from responders on demographic and clinical variables. Ethical approval was obtained from the ethics committees in Aarhus and Vejle Municipalities, and the study was carried out according to the Helsinki Declaration.

Procedure

Patients were approached and informed about the project by staff in the Department of Cardiology. If patients agreed to participate, they were given a questionnaire, written information about the project, and an informed consent form. Patients returned questionnaires by mail. Due to logistic problems 4 months into data collection, we decided to adopt the policy of sending out a written reminder to patients who had not returned their questionnaire within 2 weeks.

Measures

Socio-demographic variables included gender, age, marital status, education, working status, and smoking status.

Clinical variables [angina pectoris, left ventricular ejection fraction (LVEF), and beta-blocker therapy] were obtained from patients' medical records.

The Posttraumatic Diagnostic Scale (PDS) was used to assess posttraumatic stress disorder (PTSD) [20,21]. The PDS has been validated against the Structured Clinical Interview for DSM-IV and has good sensitivity and specificity [21]. The patients were asked to consider the 17 items comprising the symptom clusters of PTSD in relation to their MI. The items are answered on a four-point Likert scale from 0 to 3 (score range 0–51). This was done to ensure that their responses reflected whether the MI was the traumatic event resulting in PTSD. A similar approach has been adopted in a British study [22].

Anxiety and depression were measured with the anxiety and depression subscales of the Trauma Symptom Checklist [23]. The psychometric properties of the two subscales have proven adequate [23]. The two subscales contain nine items, respectively, that are answered on a four-point Likert scale from 0 to 3 (score range 0–27).

The 24-item Health Complaints Scale (HCS) was developed in cardiac patients, and assesses somatic (12 items) and cognitive complaints (12 items) on a five-point Likert scale from 0 to 4 (score range 0–48) [24]. A higher score indicates more cognitive and somatic complaints, respectively. The HCS is a psychometrically sound instrument that measures symptoms that are distinct from psychopathology. It is also sensitive to detect change following cardiac rehabilitation [25].

Neuroticism was assessed by the short version of the Eysenck Personality Questionnaire, which contains 12 items with the response categories 1 (yes) and 0 (no) [26,27]. The total score ranges from 0 to 12, with a high score indicating more of the personality trait. The psychometric properties of the subscale have proven satisfactory [27].

Personality Type D was assessed with the 16-item Personality Type D Scale [28]. The scale was developed in cardiac patients, and measures negative affectivity, i.e., the tendency to experience distress, and social inhibition, i.e., the nonexpression of this affect in social interactions. The inhibition of expression is conscious in order to avoid the condemnation of others. Each item is rated according to a five-point Likert scale from 0 to 4. Those who score high on both negative affectivity and social inhibition determined by a median split are classified as

Table 1
Scores on distress and cognitive and somatic complaints according to a median split on social support

| | Total group ($N=111$), mean (S.D.) | Low social support ($n=57$), mean (S.D.) | High social support ($n=54$), mean (S.D.) | P | Effect size |
|----------------------|---|---|--|-------|----------------|
| PTSD, n (%) | 25 (23) | 18 (32) | 7 (13) | .023* | 0.59 |
| Anxiety | 2.61 (2.06) | 2.98 (2.00) | 2.21 (2.09) | .062 | 0.38 |
| Depression | 4.28 (3.15) | 4.91 (3.16) | 3.56 (3.03) | .026* | 0.44 |
| Cognitive complaints | 14.98 (11.99) | 15.42 (11.79) | 14.49 (12.39) | .684 | 0.08 |
| Somatic complaints | 12.78 (9.93) | 13.78 (9.60) | 11.79 (10.34) | .297 | 0.20 |

* $P<.05$.

Table 2

Scores on distress and cognitive and somatic complaints according to a median split on satisfaction with support

| | Total group (<i>n</i> = 111), mean (S.D.) | Low satisfaction (<i>n</i> = 50), mean (S.D.) | High satisfaction (<i>n</i> = 61), mean (S.D.) | <i>P</i> | Effect size |
|----------------------|---|---|--|----------|----------------|
| PTSD, <i>n</i> (%) | 25 (23) | 18 (36) | 7 (11) | .003** | 0.64 |
| Anxiety | 2.61 (2.06) | 3.15 (2.08) | 2.16 (1.96) | .016 * | 0.49 |
| Depression | 4.28 (3.15) | 5.37 (3.07) | 3.37 (2.94) | .001*** | 0.67 |
| Cognitive complaints | 14.98 (11.99) | 17.56 (11.25) | 12.89 (12.24) | .040 * | 0.40 |
| Somatic complaints | 12.78 (9.93) | 15.53 (9.94) | 10.56 (9.43) | .008** | 0.51 |

* *P* < .05.** *P* < .01.*** *P* < .001.

Type D. The validity and reliability of the scale are satisfactory [28].

The Crisis Support Scale (CSS), comprising seven items rated on a seven-point Likert scale from 1 to 7, was used to measure social support [29,30]. The first six items are summed into a total score of social support (score range 6–42), referred to as “social support” in the remainder of the article. The last item measures overall satisfaction with support (score range 1–7), referred to as “satisfaction with support.” In general, a higher score indicates a higher level of support and satisfaction with support. The CSS has proven to be a valid and reliable instrument [29–31].

Statistical analyses

One patient had to be omitted from analyses due to missing values on social support. Patients were divided into high and low social support and satisfaction with support according to a median split. We used Fisher’s exact test (two-sided) for dichotomous variables, and the Student’s *t* test (two-tailed) for continuous variables. To quantify differences between groups, we calculated the effect size using Cohen’s thresholds for independent samples and chi-square [32]. Odds ratios (ORs) were calculated for dichotomous variables. To examine whether personality traits mediate the effect of social support on distress and health complaints, we performed multiple linear regression analyses for continuous outcome measures and logistic regression analyses

for dichotomous outcome measures. Preselected variables comprised gender, age, neuroticism, Type D personality, social support, satisfaction with support, angina pectoris, and LVEF. All statistical analyses were performed using SPSS 9.0 for Windows.

Results

Thirty-three (30%) were females. The mean (S.D.) age was 60 (10) years, and 98 (88%) were married or had a partner. The mean (S.D.) years in school and continuing education were 8.5 (1.5) and 3.2 (3.7), respectively. Forty-seven (42%) patients were working and 13 (12%) were smoking. Fourteen (13%) patients had severely impaired LVEF ($\leq 40\%$), 12 (11%) had angina pectoris, and 105 (94%) were treated with beta-blockers.

Patients with low social support scored higher on depression, and were more likely to have PTSD (OR 3.10; 95% CI 1.08–9.20) compared with patients with high social support (Table 1). We found no other statistically significant differences. Effect sizes ranged from small to large, with the largest effects sizes found on the distress measures.

Patients with low satisfaction scored significantly higher on all distress and health complaints measures and were also more likely to have PTSD (OR 4.34; 95% CI 1.50–12.98) compared to patients with high satisfaction with support (Table 2). Larger effect sizes were generally found on satisfaction with support compared with social support.

Neuroticism was an independent predictor of all types of distress and health complaints, including incidence of PTSD (OR 1.22; 95% CI 1.02–1.46) (Table 3). Younger age and angina pectoris were related to more somatic and cognitive complaints, and greater satisfaction with support was associated with lower scores on depression adjusting for all other variables.

Discussion

Patients with high satisfaction with support scored lower on all types of distress and health complaints, whereas high social support was only related to depression and incidence

Table 3

Predictors of distress and cognitive and somatic complaints^a

| Distress measures | Predictor variables | <i>B</i> | S.E. | <i>P</i> |
|----------------------|------------------------------|----------|--------|----------|
| Anxiety | Neuroticism | 0.301 | 0.058 | <.001 |
| Depression | Satisfaction with support | −0.704 | 0.285 | .015 |
| | Neuroticism | 0.315 | 0.090 | .001 |
| PTSD | Neuroticism | 0.1992 | 0.0909 | .028 |
| Somatic complaints | Age | −0.219 | 0.093 | .020 |
| | Angina pectoris ^b | −10.470 | 2.879 | <.001 |
| | Neuroticism | 0.825 | 0.295 | .006 |
| Cognitive complaints | Age | −0.252 | 0.113 | .028 |
| | Angina pectoris ^b | −8.165 | 3.503 | .022 |
| | Neuroticism | 1.458 | 0.359 | <.001 |

^a Adjusted for all other variables.^b Coded as 1 = yes; 2 = no.

of PTSD. This suggests that satisfaction with support may be a more salient mediator of distress and health complaints than social support per se. Effect sizes for satisfaction with support were also generally larger compared with those for social support. Others have also pointed out the salience of satisfaction with support in relation to distress [3,33].

When including personality factors, satisfaction with support only remained an independent predictor of depression, whereas neuroticism was identified as an independent predictor of all outcome measures. This suggests that neuroticism may mediate social support and its influence on distress and health complaints. It also underscores the importance of including personality factors when studying social support in relation to distress and health [17,18]. In fact, traits may exert a more stable effect on outcome than other individual difference variables routinely included in cardiovascular research [15,34].

Disease severity was not related to psychological distress and health complaints. Other studies have also shown that psychopathology is not a result of more severe cardiac disease [13,14,35].

The current study has some limitations. Cause and effect cannot be determined, since patients were not assessed prior to their MI. The nonresponse rate was 25%, but no differences were found between responders and nonresponders on demographic and clinical variables.

In conclusion, these results suggest that social support and its influence on distress and health complaints may be mediated by personality traits. Studies are now needed to determine which interventions are successful in moderating personality traits in cardiac patients, since traits have been shown to influence distress, social support, morbidity, and mortality. Despite the misconception that personality types and traits cannot be changed, there is evidence to counter this [34]. In clinical practice, screening for particular personality traits could identify patients at risk of distress and recurrent cardiac events.

Acknowledgments

We thank the nurses at Aarhus University Hospital and Horsens Hospital for helping with data collection. Special thanks are given to project nurse Vibeke Reiche Soerensen, Aarhus University Hospital, for supervising data collection. This research was supported by grant no. 99-1-F-22717 provided by the Danish Heart Foundation.

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